



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,457	10/18/2005	Stephan Schwartz	000009-008	4925
51707 WRB-IP LLP 1217 KING STREET ALEXANDRIA, VA 22314	7590 12/28/2009		EXAMINER DAVIS, PATRICIA A	
			ART UNIT 1795	PAPER NUMBER
			NOTIFICATION DATE 12/28/2009	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

HARRY@WRB-IP.COM  
angie@wrb-ip.com

# Office Action Summary

**Application No.**

10/528,457

**Applicant(s)**

SCHWARTZ, STEPHAN

**Examiner**

PATRICIA DAVIS

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 September 2009.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 30-60 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 30-60 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SI/22)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. The Applicant's amendment filed on September 9, 2009 was received. Claims 1-29 were cancelled. Claims 30 and 33-36 were amended.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on April 15, 2009.

***Claim Rejections - 35 USC § 102***

3. The claim rejections under 35 U.S.C. 102(e) as anticipated by Ren et al. on claims 1-43, 47-51, 59 and 60 are withdrawn, because independent claim 1 was amended.
4. Claims 30-43, 47-51, and 59-60 are rejected under 35 U.S.C. 102(e) as being anticipated by Ren et al. (US 6,458,479).

Regarding claim 30, Ren et al. teaches a fuel cell comprising: an electrolyte provided with electrodes in the form of an anode and a cathode on opposite sides of the electrolyte (col. 2, lines 40-45, Fig. 1), a system of flow ducts arranged so as to bring a first flow containing a first reactant into contact with an anode active surface and to bring a second flow containing a second reactant into contact with a cathode active surface, wherein the system of flow ducts comprises a distribution arrangement adapted to distribute a flow incoming to at least one of the anode active surface and the cathode active surface uniformly over an inlet region which extends along the at least one of the

anode active surface and the cathode active surface (col. 3, lines 42-51). It can be shown from figure 1 of Ren et al. '479 that the space between the bars (28, 29) along with the perforations of the current collectors (22, 24) allow for the reactants (methanol and air) to reach the catalyst layers (see col. 3, lines 38-66). The space between the bars is able to extend to the cathode and anode backings (18, 16 respectively) by the fact that the space between the bars (28,29) is large enough to account for covering the majority of the perforations of the current collectors (22, 24) which leaves for open holes directly in contact with the cathode and anode backings (18, 16 respectively).

Therefore, it would have been obvious to one with ordinary skill in the art to see that the spaces are at least partially defined by both the anode and the cathode surfaces.

Regarding claim 31, Ren et al. teaches a fuel cell, wherein the inlet region (perforations, col. 3, lines 45) extends along at least approximately half of the cathode active surface (col. 3, lines 48-51).

Regarding claim 32, Ren et al. teaches a fuel cell, wherein the inlet region is located adjacent to a delimitation (cell body, 10, col. 2, lines 35-40, Fig. 1) of the cathode active surface.

Regarding claim 33, Ren et al. teaches a fuel cell, wherein the system of flow ducts comprises a collecting arrangement (opening space in compression reinforcement bar, 28, col. 3, lines 59-65, Fig. 1) adapted to allow a flow outgoing from the cathode active surface to leave the cathode active surface within an outlet region (perforations, col. 3, lines 45) which extends along at least half of the cathode active surface.

Regarding claim 34, Ren et al. teaches a fuel cell, wherein the outlet region is located adjacent to a delimitation (cell body, 10, col. 2, lines 35-40, Fig. 1) of the cathode active surface and opposite the inlet region.

Regarding claim 35, Ren et al. teaches a fuel cell, wherein the inlet region and the outlet region are substantially parallel to one another (perforations, col. 3, line 45, Fig. 1).

Regarding claim 36, Ren et al. teaches a fuel cell, wherein the collecting arrangement comprises: a collecting chamber/opening space in compression reinforcement bar which extends along the cathode surface, an outlet opening/perforations which allows flow from the cathode active surface to the collecting chamber (col. 3, lines 29-67).

Regarding claim 37, Ren et al. teaches a fuel cell, wherein the distribution arrangement comprises: a distribution chamber/opening space in compression reinforcement bar which extends along the cathode surface, an inlet opening/perforations which allows flow from the distributing chamber/opening space in compression reinforcement bar to the cathode active surface (col. 3, lines 29-67).

Regarding claim 38, Ren et al. does not disclose a fuel cell, wherein the inlet opening provides greater flow resistance than through the distribution chamber. However, it is the position of the Examiner that such properties are inherent, given that Ren et al. and the present application utilize similar inlet openings. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Regarding

product and apparatus claims, when the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. The Courts have held that it is well settled that where there is a reason to believe that a functional characteristic would be inherent in the prior art, the burden of proof then shifts to the applicant to provide objective evidence to the contrary. See *In re Schreiber*, 128 F.3d at 1478, 44 USPQ2d at 1478, 44 USPQ2d at 1432 (Fed. Cir. 1997) (see MPEP § 2112.01, I.).

Regarding claims 39-43, Ren et al. teaches a fuel cell, wherein the fuel cell is formed of a layer structure comprising: a first layer in which the cathode active surface (18, Fig. 1) is located and extends essentially in a plane; a second layer provided with an inlet opening/perforations (22, Fig. 1) and is essentially parallel to the first layer and is located at a distance from the first layer; third layer (compression reinforcement bar, 28, col. 3, lines 59-65, Fig. 1) comprises at least partly a through-cutout, where the second layer is located between the first layer and the third layer, the second layer and the third layer at least partly defining limiting surfaces for the distribution chamber/opening space in compression reinforcement bar; fourth layer (air side filter, 32, Fig. 1) at least partly defines a limiting surface for the distribution chamber.

Regarding claim 47, Ren et al. teaches a fuel cell, wherein the second layer (22, Fig. 1) at least partly defines a delimiting surface in a cell space at the cathode active surface, and wherein the second layer at least partly defines a delimitation between the cell space and the distribution chamber/opening space in compression reinforcement bar, and wherein the second layer is provided with at least one opening/perforations,

which at least one opening allows communication between the distribution chamber/opening space in compression reinforcement bar and the cell space and forms the at least one inlet opening/perforations (col. 3, lines 42-51 ).

Regarding claim 48, Ren et al. teaches a fuel cell, wherein the second layer is located at a distance from the cathode active surface (col. 3, lines 37-40).

Regarding claim 49, Ren et al. teaches a fuel cell, wherein the cell is provided with a conductor (current collector, 22, 24, Fig. 1, col. 3, lines 39-55) adapted to conduct electric current between the electrode and the second layer.

Regarding claim 50, Ren et al. does not disclose a fuel cell, wherein the conductor is resilient. However, it is the position of the Examiner that such properties are inherent, given that Ren et al. and the present application utilize similar conductors. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Regarding product and apparatus claims, when the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. The Courts have held that it is well settled that where there is a reason to believe that a functional characteristic would be inherent in the prior art, the burden of proof then shifts to the applicant to provide objective evidence to the contrary. See *In re Schreiber*, 128 F.3d at 1478, 44 USPQ2d at 1478, 44 USPQ2d at 1432 (Fed. Cir. 1997) (see MPEP § 2112.01, I.).

Regarding claim 51, Ren et al. teaches a fuel cell, wherein the conductor provides a flow pattern close to the cathode active surface (col. 3, lines 40-50).

Regarding claim 59, Ren et al. teaches a fuel cell, wherein the distribution arrangement is adapted to distribute a flow incoming to both the anode and the cathode active surface (col. 3, lines 38-67).

Regarding claim 60, Ren et al. teaches a fuel stack (col. 1, lines 30-32).

***Claim Rejections - 35 USC § 103***

5. The claim rejections under 35 U.S.C. 103(a) as unpatentable over Ren et al. (US 6,458,479) in view of Ren (US 6,296,964) on claims 44-46, 52-58 are maintained. The rejection is repeated below for convenience.

Regarding claims 44-45, 53, and 54, Ren et al. teaches a fuel cell, wherein the third layer comprises at least one distribution chamber and at least one collection chamber.

Ren et al. does not specifically teach a fuel cell, wherein the third layer comprises at least one cooling chamber.

However, Ren teaches a fuel cell stack, wherein cooling plates are periodically interspersed between the fuel cell assemblies. Coolant is distributed in some manner across the cooling plates through bipolar plates (col. 4, lines 29-37) in order to enhance the utilization of the direct methanol fuel cell (col. 2, lines 16-20). Consequently, incorporation of a cooling chamber/bipolar plate to the fuel cell of Ren et al. would be effective because it would enhance the utilization of the direct methanol fuel cell.



Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the concept of cooling chamber/bipolar plate to the fuel cell of Ren et al. in order to enhance the utilization of the direct methanol fuel cell.

Regarding claim 46, Ren et al. teaches a fuel cell that can also be incorporated into fuel cell stacks (col. 1, lines 29-35). One of ordinary skill in the art would recognize that, for the fuel cell stack to function, a fifth layer need be provided with a second distribution chamber and collecting chamber in another direction.

Regarding claim 52, Ren et al. does not disclose a fuel cell, wherein the conductor comprises a net structure. The Courts have held that the change in the form or shape, without any new or unexpected results, is an obvious engineering design. See *In re Dailey*, 149 USPQ 47 (CCPA 1976) (see MPEP § 2144.04). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the conductor comprise a net structure.

Regarding claim 55, Ren teaches a fuel cell, wherein the cooling chamber is provided with a conductor adapted to conduct electric current through the cooling chamber (col. 4, lines 29-37).

Regarding claim 56, Ren et al. does not disclose a fuel cell, wherein the conductor is resilient. However, it is the position of the Examiner that such properties are inherent, given that Ren et al. and the present application utilize similar conductors. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Regarding product and apparatus claims, when the structure recited in the reference is

substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. The Courts have held that it is well settled that where there is a reason to believe that a functional characteristic would be inherent in the prior art, the burden of proof then shifts to the applicant to provide objective evidence to the contrary. See *In re Schreiber*, 128 F.3d at 1478, 44 USPQ2d at 1478, 44 USPQ2d at 1432 (Fed. Cir. 1997) (see MPEP § 2112.01, I.).

Regarding claim 57, Ren teaches a fuel cell, wherein the conductor provides a flow pattern for increased cooling effect relative to a cooling effect with no conductor (col. 4, lines 29-37).

Regarding claim 58, Ren does not disclose a fuel cell, wherein the conductor comprises a net structure. The Courts have held that the change in the form or shape, without any new or unexpected results, is an obvious engineering design. See *In re Dailey*, 149 USPQ 47 (CCPA 1976) (see MPEP § 2144.04). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the conductor comprise a net structure.

### ***Response to Arguments***

6. Applicant's arguments filed on September 9, 2009 have been fully considered but they are not persuasive.

*Applicant's principal argument is:*

*(a) that Ren et al. '479 has no structure corresponding to a cell space at least partially defined by at least one of an anode active surface and a cathode active*

*surface, nor does it disclose a system of flow ducts comprising a distribution arrangement adapted to distribute a flow incoming to the cell space uniformly over an inlet region which extends along at least one of the anode active surface and the cathode active surface and/or a collecting arrangement adapted to allow a flow outgoing from the cell space to leave the cell space within an outlet region.*

In response to Applicant's argument, please consider the following comment.

(a) Ren et al. '479 teaches compression reinforcement bars (system of flow ducts 28, 29) that have a space between the bars (28, 29) that allow air to flow from the cell body (system 10). It can be shown from figure 1 of Ren et al. '479 that the space between the bars (28, 29) along with the perforations of the current collectors (22, 24) allow for the reactants (methanol and air) to reach the catalyst layers (see col. 3, lines 38-66). The space between the bars is able to extend to the cathode and anode backings (18, 16 respectively) by the fact that the space between the bars (28,29) is large enough to account for covering the majority of the perforations of the current collectors (22, 24) which leaves for open holes directly in contact with the cathode and anode backings (18, 16 respectively). Therefore, the spaces are at least partially defined by both the anode and the cathode surfaces.

### **Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICIA DAVIS whose telephone number is (571)270-7868. The examiner can normally be reached on 7:30am-5pm EST. Monday-Friday, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICIA DAVIS/  
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/  
Supervisory Patent Examiner, Art Unit 1795